

# Roboanalyzier online competition

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# Task 1

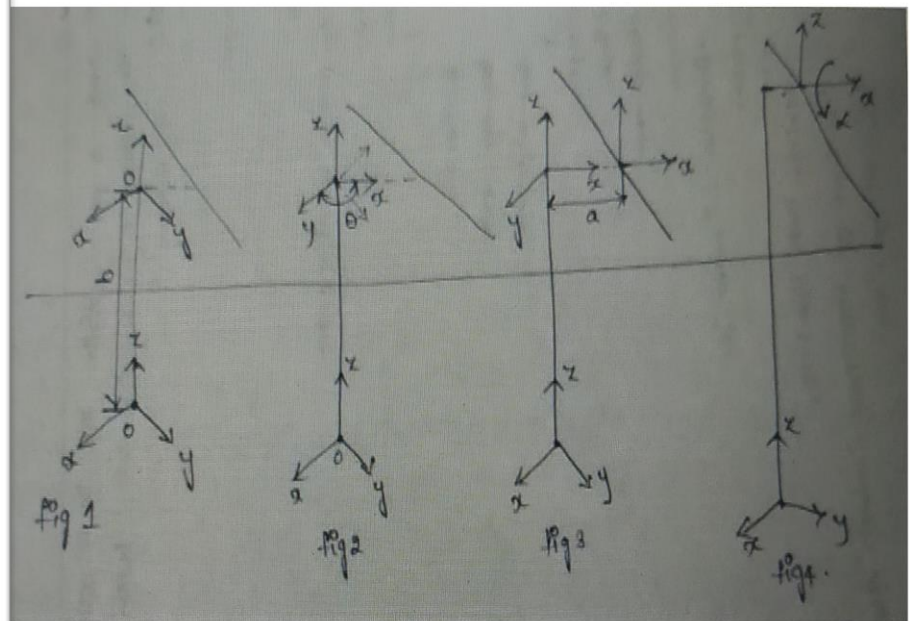
- Degree's of freedom: In general, DOF are the set of independent displacements that specify completely the displaced or deformed position of the form or the system. In Robotics, DOF is of used to describe the number of directions that a robot can move a joint.
- **Homogeneous Transformations:**

It is used to represent position and rotation information of one with respective to another.

# Denavit-Hartenberg Parameters

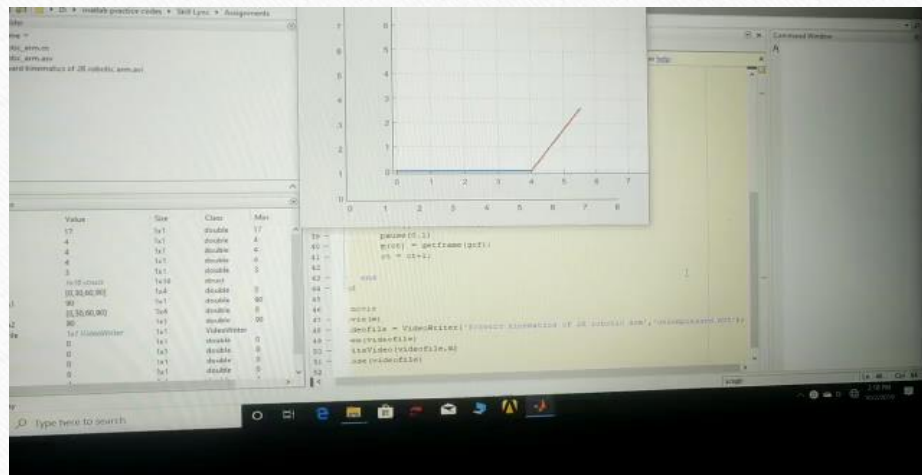
A Systematic notation for assigning right-handed orthonormal coordinate frame Transformations between adjacent frames can be represented by a single standard 4\*4 homogeneous coordinate transformation.

**FIG-1:** Translate  $(z(b))$  till intersection of z-axis on common normal joint of set. **Fig-2 :** Rotate  $z(\theta)$  so that x-axis aligns with common normal joint angle. **FIG-3 :** Translation  $x(a)$  till intersection of common normal and line link length. **FIG-4:** Rotate  $x(a)$  so that z-axis aligns with the line twist angle.

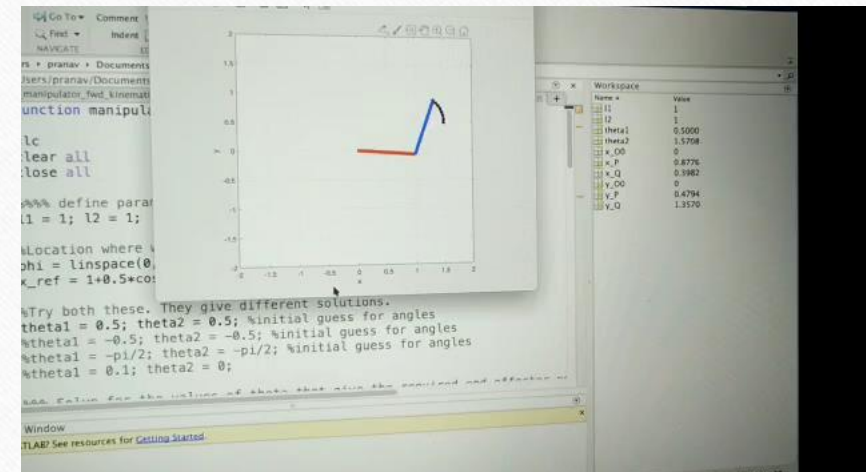


# TASK-2

- FORWARD KINEMATICS

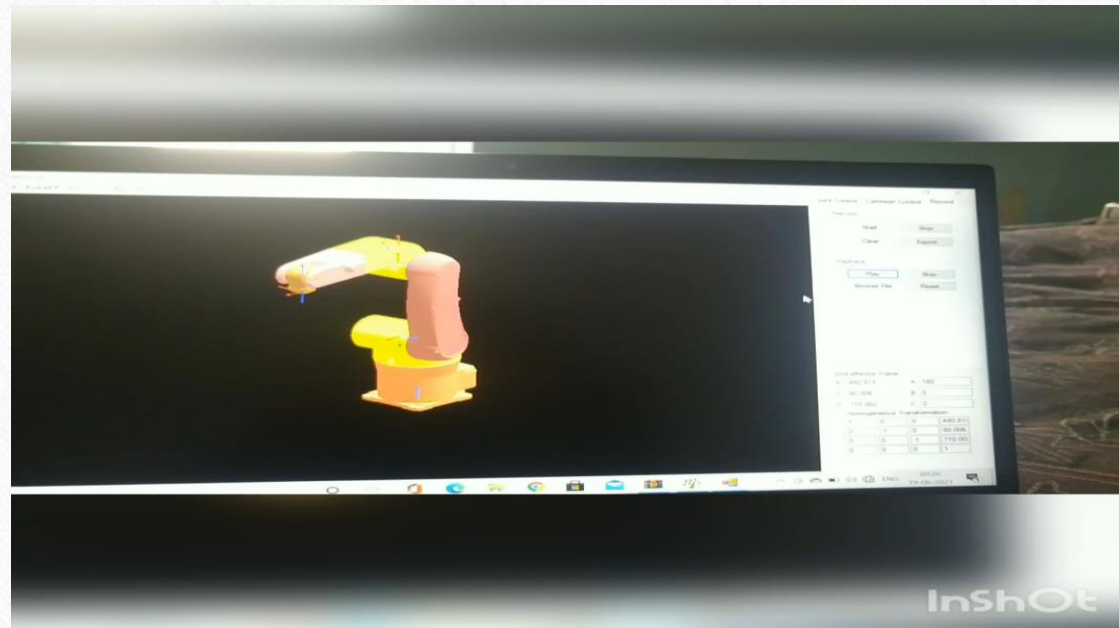


- INVERSE KINEMATICS



# TASK-3

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# TASK-4

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